

Implementation Guidance for the Technical Peer Review Process

Version 4.0

August 2001

**Prepared for the Office of Science and Technology
By the Center for Risk Excellence**



Send comments to:

Charles Nalezny
HQ Peer Review Program Manager
Office of Science and Technology
Office of Environmental Management
U.S. Department of Energy
Cloverleaf Complex
20400 Century Blvd.
Germantown, MD 20874
Phone: (301) 903-1742
Fax: (301) 903-7457
Email: charles.nalezny@em.doe.gov

Yvette T Collazo
Peer Review Coordinator
Center for Risk Excellence
Chicago Operations Office
U.S. Department of Energy
9800 South Cass Avenue
Argonne, IL 60439
Phone: (630) 252-2102
Fax: (630) 252-2654
Email: yvette.collazo@ch.doe.gov
Homepage: <http://riskcenter.doe.gov>

Betty R. Love
Administrative Manager of the
Peer Review Program
Institute for Regulatory Science
5457 Twin Knolls Road, Suite 408
Columbia, MD, 21045
Phone: (301) 596-1700
Fax: (301) 596 1707
Email: moghissi@nrsl.org
Website: www.nars.org

TABLE OF CONTENTS

1.0 Summary	
1.1 Purpose of the Implementation Guidance	1
1.2 Salient Features of the Program	1
1.3 Sources of Additional Information	1
1.4 List of Abbreviations.....	2
2.0 The OST Peer Review Policy and its Implementation	
2.1 Introduction	3
2.2 Objective of Peer Review.....	3
2.3 Multitude of OST Reviews	3
2.4 Implementation	5
2.5 Decision Process.....	5
2.6 Peer Review Coordinator.....	5
2.7 Structure of OST Peer Review Program	7
2.8 Principles of Review Panel Operation	9
3.0 The Peer Review Process	
3.1 Types of ASME Peer Review.....	10
3.2 Application of the Project Screening Approach in Project Selection.....	11
3.2.1 The Process	11
3.2.2 Projects Exempt From Peer Review	12
3.3 Peer Review Schedules	12
3.4 Core Technical Peer Review Criteria.....	13
3.5 Technology-Specific Peer Review Criteria	18
3.6 Preparation for Peer Review	18
3.7 Document Preparation	19
3.8 Response to the RP Recommendations	19
4.0 Roles and Responsibilities	
4.1 OST Office Directors.....	22
4.2 Focus Area/Crosscut Lead Program Managers.....	22
4.3 Focus Area/Crosscut Points of Contact for Peer Review.....	22
4.4 Principal Investigators.....	23
4.5 Peer Review Coordinator.....	23
4.6 Headquarters Peer Review Program Manager.....	23
4.7 Administrative Manager of the Peer Review Program.....	24
4.8 Technical Secretary of the Review Panels	24
References	25

TABLE OF FIGURES

Figure 1.	OST Review Program	4
Figure 2.	OST Technology Decision Process.....	6
Figure 3.	Schematic of the OST Peer Review Process	8
Figure 4.	Documentation Required for Peer Review by Gate Location.....	21

1.0 Summary

1.1 Purpose of the *Implementation Guidance*

This guidance relates to the peer review process of evaluating technology development activities supported by the Office of Science and Technology (OST). The OST peer review program is managed jointly by the American Society of Mechanical Engineers (ASME) and the Institute for Regulatory Science (RSI). The process is predicated upon the ASME furnishing qualified and independent third party review panels. The RSI is the grantee for this effort and administers the operation of the Review Panels (RP). This guidance describes the OST peer review policy and its implementation, peer-review process and procedures, key functions and responsibilities, and other relevant topics.

1.2 Salient Features of the Program

- To avoid misunderstanding, OST is restricting the term “technical peer review” only to those technical reviews conducted by independent, external experts.
- The coordination of peer review activities within OST is the task of the Peer Review Coordinator (CPR) at the Chicago Operations Office.
- A nationally recognized technical organization, the ASME, conducts the reviews.
- All Department of Energy (DOE) staff and contractors with real or potential conflicts of interest are excluded from consideration as reviewers.
- The results of the peer reviews as well as the DOE responses to recommendations of the RP, including any appropriate actions committed to by the OST, are published in the annual ASME Report of the Peer Review Program entitled, *Assessment of Technologies Supported by the Office of Science and Technology of the Department of Energy*.

1.3 Sources of Additional Information

This document contains guidance for Focus Area and Crosscut (FA/CC) Program Managers, Product Line Managers (PLMs), Project Managers, Principal Investigators (PIs) and other members of the Project Team who are involved in the peer review process. It specifically excludes policies and procedures related to the activities of ASME/RSI. The *Handbook of Peer Review* published and widely distributed by the RSI contains the ASME’s *Manual for Peer Review* and various procedures implementing ASME policies. The Handbook is also available at

RSI's web site, <http://www.NARS.org>. Additionally, any relevant material pertaining to the OST Peer Review Process may be accessed through the Center for Risk Excellence's (CRE), Homepage at <http://riskcenter.doe.gov>.

1.4 List of Abbreviations

AMPRP	Administrative Manager of the Peer Review Program
ASME	American Society of Mechanical Engineers
ASTD	Accelerated Site Technology Deployment
CEMT	NRC Committee on Environmental Management Technologies
CPR	Peer Review Coordinator
CRE	Center for Risk Excellence
DAS	Deputy Assistant Secretary
DOE	Department of Energy
EM	Environmental Management
EMAB	Environmental Management Advisory Board
EP	Executive Panel
FA/CC	Focus Area/Crosscut
FETC	Federal Energy Technology Center (currently NETL)
GAO	General Accounting Office
IDMS	Interim Data Management System
MSDS	Material Safety Data Sheets
NAS	National Academy of Science
NETL	National Energy Technology Center
NMS	Needs Management System
NRC	National Research Council
OST	Office of Science and Technology
PI	Principal Investigators
PLM	Product Line Managers
POC	Point of Contact
PRC	Peer Review Committee
R&D	Research and Development
RP	Review Panels
RSI	Institute for Regulatory Science
S&H	Safety and Health
SSAB	Site Specific Advisory Board
STCG	Site Technology Coordination Group
TMS	Technology Management System
TPRR	Technical Peer Review Report
TS	Technical Secretary
TTP	Technical Task Plan

2.0 OST Peer Review Policy and Its Implementation

2.1 Introduction

The OST, at headquarters and in the field, has conducted technology reviews of its various activities since the program's inception. These reviews have been traditionally used by OST's FA/CC programs and have helped to ensure that technologies under development are of high quality and have the best possible opportunity for implementation. In many cases, these reviews were conducted by independent, non-compromised, technical experts and were effective and helpful to the Program Managers. However, these reviews did not provide confidence to the outside world of science, technology, and political oversight that the system was credible or effective.

To address the concerns of external review groups such as the General Accounting Office (GAO) and the National Research Council, and to meet the increasing technical review needs of the FA/CC programs, the OST initiated an office-wide technical peer review program. Accordingly, peer reviews were made an integral part of program management, supporting the development of OST's program strategy and its investment decisions.

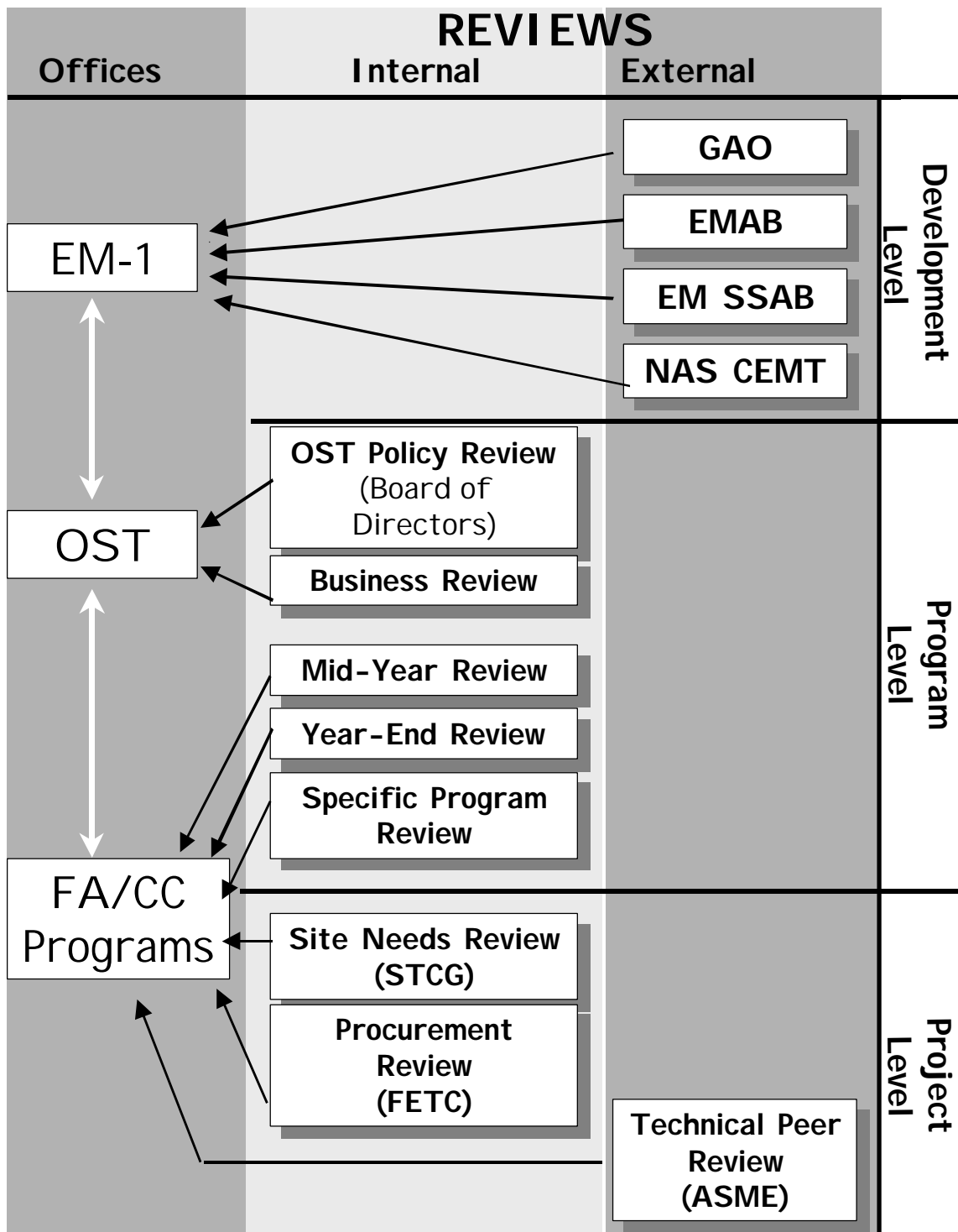
2.2 Objective of Peer Review

The objective of Peer Review is to provide the OST decision makers with uniform, independent, and unimpeachable technical reviews, on a timely basis, to assess the scientific and engineering merit of the OST technology development activities.

2.3 Multitude of OST Reviews

The OST relies upon a number of reviews to initiate, develop and deploy technologies. These include department, program, and project reviews as well as technical assessments. Each review type has a specific purpose, and uses appropriate criteria for evaluating the review subject and selecting reviewers. Figure 1, page 4 illustrates the level and types of reviews conducted for or by OST.

FIGURE 1: OFFICE OF SCIENCE AND TECHNOLOGY REVIEW PROGRAM



2.4 Implementation

The mission of OST is to support the development and deployment of innovative technologies for environmental management with the greatest returned value. Return on investment represents a combination of timeliness, effectiveness, efficiency, and cost of development. Technical peer reviews secure the best possible scientific and technical assistance for the developers and decision-makers involved in this program, including assistance regarding occupational safety and health. Furthermore, technical peer reviews provide an essential management tool in determining the scientific and engineering merits of technologies and systems in which the OST has placed its investment.

2.5 Decision Process







The purpose of a technical peer review is to evaluate a technology or system for its scientific and technical merit, relevance to the cited problems, and probable impact on the scientific field. On the other hand, the purpose of the broader OST Technology Decision Process depicted in Figure 2 is to evaluate projects against both technical and non-technical criteria to ensure end products provide superior performance in meeting the requirements of the intended customers.

Technology projects are evaluated at critical decision points (or gates) between each maturation stage of the Research and Development (R&D) process. Before a project can move to a new R&D stage, a go/no-go decision must be made based on criteria defined for each gate. Although technical peer review is a tool to assist in making go/no-go decisions, it is not synonymous with decision-making and should not represent the decision-making process in and of itself.

2.6 Peer Review Coordinator

Recognizing the need for coordination of OST technical peer reviews, the Deputy Assistant Secretary (DAS) of OST has appointed a CPR at the CRE under the Chicago Operations Office. The CPR represents the DAS in dealing with the ASME/RSI and is responsible for coordinating all peer review activities.

Figure 2: OST Technology Decision Process

Technology Maturation Stages	Basic Research	Applied Research	Exploratory Development	Advanced Development	Engineering Development	Demonstration	Implementation
	Idea Generation		Proof of Technology		Engineering Prototype	Production Prototype	Utilization by End-user
	No Need	Need	Product Definition <ul style="list-style-type: none"> • non-specific applications • bench-scale 	Working Model <ul style="list-style-type: none"> • reduction to practice • specific applications • bench-scale 	<ul style="list-style-type: none"> • scale-up to test design features and performance limits • pilot-scale • field testing 	<ul style="list-style-type: none"> • end-user validation • full-scale • “beta” site testing 	
Gates							
Expectations			Address priority DOE Need Knowledge of similar efforts	Show clear advantage over available technology	Meet cost/benefit requirement Demonstrate significant end-user demand	Technology ready for end-user	End-user deploys technology
Peer Review			REQUIRED			REQUIRED	

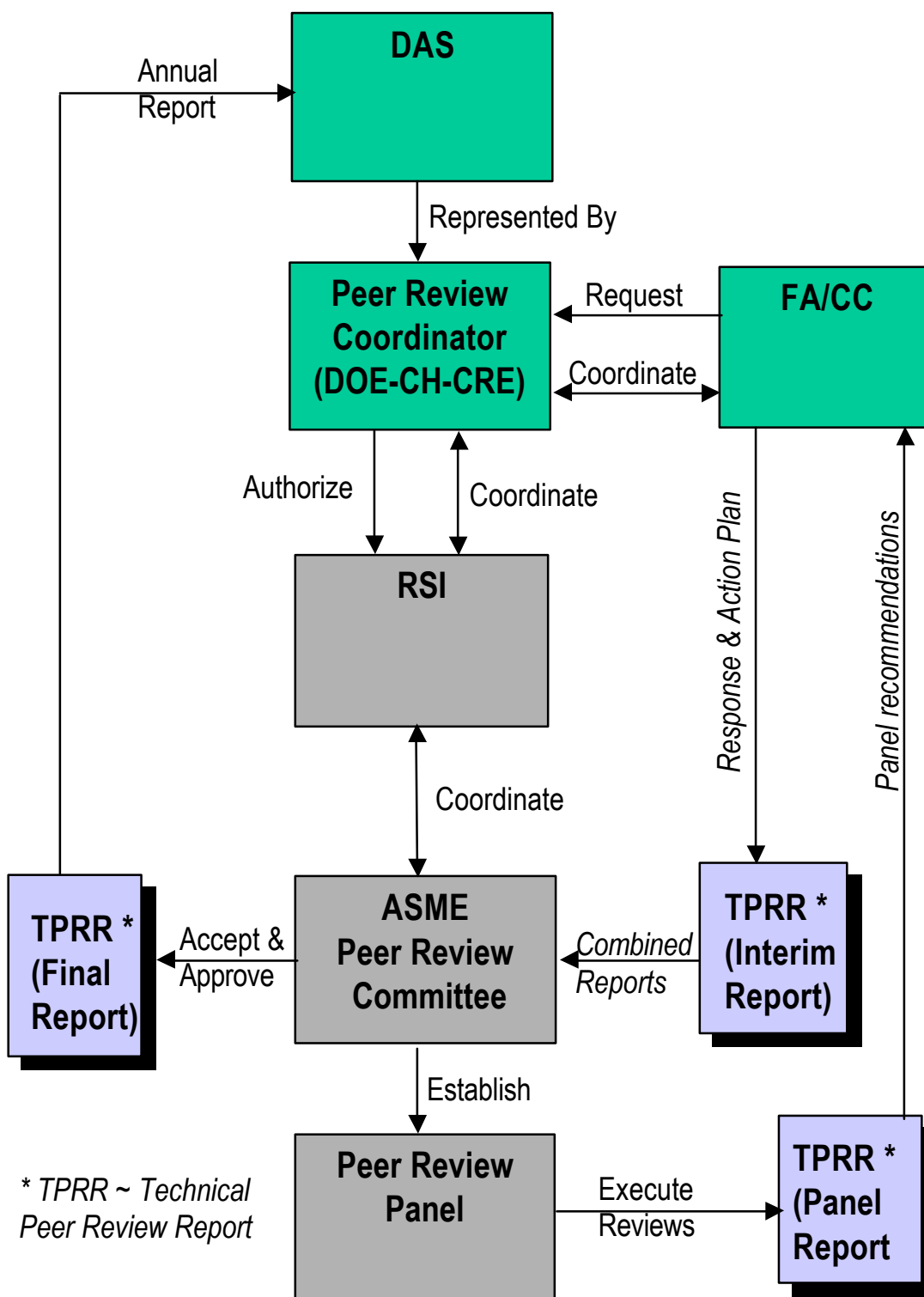
2.7 Structure of OST Peer Review Program

In order to ensure consistency with OST objectives, a grant has been awarded to RSI for a joint ASME/RSI effort to perform technical peer reviews for OST supported technology developments. The ASME has established a Peer Review Committee (PRC), a standing committee within the Center for Research and Technology Development which meets several times per year to review and approve *Interim Reports*. In November, the PRC presents the *Annual Report of the Peer Review Program* for the previous fiscal year to the DAS. The Executive Panel (EP) of the PRC meets frequently and is responsible for the day-to-day operation of the peer review program. The technical peer review is performed by a RP, which is formed and disbanded, once the peer review is complete.

The product of the technical peer review is a *Technical Peer Review Report*, which is prepared in three stages:

- Stage 1: The *Report of the Review Panel* is prepared by the RP in collaboration with the Technical Secretary (TS). This report is provided to the cognizant OST staff including the appropriate FA/CC Program Managers and PIs who prepare a response to the recommendations of the RP;
- Stage 2: The *Interim Report* is a combination of the *Report of the Review Panel* and the DOE's response to the recommendations of the RP;
- Stage 3: The *Final Report* is the product of a reviewed and approved *Interim Report* by the ASME PRC. This process involves the approval of the *Report of the Review Panel* and the acceptance of the DOE response to the recommendations of the RP. This *Final Report* is included in the *Annual Report of the Peer Review Program* that is presented to the OST DAS at the end of the fiscal year (FY).

FIGURE 3 - SCHEMATIC OF THE OST PEER REVIEW PROCESS



2.8 Principles of Review Panel Operation

Results of the OST peer review process provide input for key decisions in the program implementation and should therefore be consistent with the operating principles and office procedures within OST. Furthermore, peer review is founded on the principle of scientific ethics which governs its application. Therefore, the operation of RP are guided by the following principles:

- Peer reviewer must observe the rules governing confidentiality and appropriate use of privileged information.
- Peer reviewers do not have authority to make decisions and are not responsible for their outcome. Such responsibility belongs to the Program Managers and OST line management.
- The *Report of the Review Panel* may not contain commitments to fund projects or programs as funding authority rests with federal employees.
- All DOE staff and contractors with real or potential conflicts of interests are explicitly excluded from consideration as reviewers.

3.0 The Peer Review Process

The process and procedures developed for the OST peer review program has evolved, and is now routinely used. Certain schedules have been established for requesting peer reviews and responding to the recommendations resulting from peer review. This section contains a detailed description of various aspects of the peer review process and the project screening approach.

3.1 Types of ASME Peer Review

The size and scope of each review depends on the type of technical review needed by the FA/CC program. In general, there are four types of technical reviews:

- Type I: Multi-Technology Review. The RP established for this type of review consists of five or more individuals who will perform a review of several related technologies or a complex project containing multiple technologies. PIs and other members of the Project Team are required to present the results of their technology development to the RP.
- Type II: Single Technology Review. The RP established for this type of review consists of at least three individuals who will perform a review of a technology. PIs and other members of the Project Team are required to present the results of their technology development to the RP.
- Type III: Document Review. The RP established for this type of review consists of at least three individuals who will perform a document review.
- Type IV: Competing Submissions. The RP is established to review new starts and competing proposals such as grant proposals. The number of individuals constituting a Type IV RP depends upon the number and nature of submissions. However, each submission must be reviewed by at least three individuals.

Type I and Type II reviews, and possibly Type IV reviews would require travel arrangements for the RP. For economic reasons the default location for the meeting of the RP is Columbia, Maryland. However, a different meeting site could be chosen if one or more of the following criteria are met:

- If the FA/CC Program Manager decides that a demonstration of a technology or a site visit would be necessary to peer review a technology;

- If the participation of stakeholders in the peer review meeting is deemed desirable;
- If the overall economy of the peer review meeting would favor another site.

Program Managers are encouraged to group multiple projects that are technically related to be reviewed in a Type I review. This approach would not only optimize the cost of the review but also would provide a better perspective to the RP of potential complementing and competing technologies. For economic reasons, a Type II Peer Review should be used only when necessary.

During Type III and IV reviews, the RP members do not interact with PIs and other members of the Project Team and thus cannot clarify uncertainties, ambiguities and other problems. Therefore, these reviews must be used for new starts or technologies that have reached a level of maturity such that a reasonably complete and coherent set of documentation is available.

3.2 Application of the Project Screening Approach in Project Selection

The Project Screening Approach (PSA) provides consistent pre-screening and prioritization of OST technology projects to support FA/CC Program Managers' identification of projects for peer review that maximize benefits from the application of limited peer review resources.

The results obtained from the PSA provides the Program Managers with a tool to:

- Screen and identify projects suitable for
 - continuation without peer review,
 - detailed evaluation through peer review, and
 - programmatic decisions;
- Reduce backlog of peer reviews; and
- Verify technology documentation sources.

3.2.1 The Process

The PSA for a given year starts during the last quarter of the previous fiscal year. During this time, a preliminary technology activity list, by FA/CC, is made available to the respective Program Managers for their review. This list includes all active funded activities that are listed in the Technology Management System (TMS). The FA/CC field managers are responsible for updating the TMS Peer Review Module by verifying all activities that should be

considered for peer review and exempting those activities that do not require a peer review. The CPR is responsible for updating all other sections of the TMS Peer Review Module.

If the number of technologies to be peer reviewed in a given year is too high, a PSA is conducted. A set of project screening criteria is used to score and rank the projects. These criteria are based on measures of relevancy, availability, and funding history. The results of the analysis are used to prioritize the projects to be peer reviewed in a given fiscal year.

3.2.2 Projects Exempt From Peer Review

While there are criteria defined for projects subject to peer review, the following are situations when a peer review is not required:

- Demonstration of commercially available technologies for which further development is not planned
- Small scale studies designed solely to collect and analyze information
- Deployments for which further development is not planned
- On a case by case basis, FA Managers may request additional exemptions. These exemptions are approved by the CPR and HQ Program Manager

3.3 Peer Review Schedules

The process for initiating peer reviews for a given year starts during the last quarter of the previous fiscal year. As mentioned before, during this period, the FA/CC field lead program managers should identify in the TMS peer review module, a list of projects that are potential candidates for peer review during the subsequent fiscal year. The FA/CC field lead program managers should also provide the CPR with the FY quarter in which they would like the peer reviews to take place. During the FY, at least 60 days prior to the requested peer review date, the FA/CC Point of Contact (POC) shall contact the CPR and provide the following information:

- Technology Title
- TMS Number
- Focus Area

- FA POC including: name, phone, fax, and email
- Principal Investigator (PI) including: name, phone, fax, and email

After this information is received, the CPR schedules a conference call for all parties involved. The purpose of the call is to discuss the peer review process, answer questions, and to determine the following information:

- Peer Review Date
- Peer Review Type
- Peer Review Location
- Proprietary information - If the project involves proprietary information, a DOE contact for the Project Team, should be responsible for the designation, distribution, and collection of all proprietary information. This process is described in detail in procedure 16 of the ASME Peer Review Manual.

At this point in the process, the Administrative Manager of the Peer Review Program (AMPRP) at RSI may interact concurrently with members of the Project Team and the CPR. However, all issues of concern should be referred to the CPR for resolution. After the conference call, the FA/CC POC and PI are responsible for providing, to RSI and the CPR, the information discussed in Section 3.6 of this guidance. The CPR is responsible for providing an official peer review request to RSI, for the technology in question. In addition, the CPR announces all peer reviews in the Chicago Operations Office, Environmental Programs Group, Center for Risk Excellence's (CRE's) homepage at: <http://riskcenter.doe.gov/>

Peer reviews can be requested and conducted at any time during the FY. When feasible, peer reviews should be conducted in conjunction with other scheduled events, as in Mid- Year Reviews, to increase synergy in accomplishing all requirements with the most effective use of resources. Furthermore, the timing of peer reviews should be connected to critical decisions in the planning/budgeting cycle related to technology.

3.4 Core Technical Peer Review Criteria

The success of the peer review of a technology depends primarily upon the careful identification of the review criteria. In effect the reviewers are being asked to respond to a question expressed in a review criterion. Furthermore, the selection of review criteria relevant to each technology requires the consideration of its uniqueness.

The following general categories for assessing the value of a technology development activity may result in one or more specific review criteria.

1. Technical Validity

The technical validity of a project is the core of peer review. The Project Team must demonstrate that it is aware of the state of the art of science and engineering as related to the project under review, and that the project is technically valid. The technical validity can thus be demonstrated by the following criteria:

- Is the Project Team aware of the relevant published scientific and engineering information as well as practices of the relevant industry?
- Is the design of the project consistent with established scientific and engineering principles and standards?
- Is the execution of the project consistent with established scientific and engineering principles and standards?
- Does the Project Team have adequate technical documentation such as publication of results in peer-reviewed journals?

2. Relevancy

All projects supported by OST must be able to demonstrate that they directly respond to an identified need by the various segments of EM, particularly the Offices of Waste Management and Environmental Restoration. The process should consist of documentation clearly indicating that a need has been identified, and the identified need is being addressed by the project under review. The relevancy can thus be demonstrated by the following review criteria:

- Does the project meet an identified EM need ?
- Is the project superior to existing technologies that address an identified EM need?

3. Overall Assessment

In many cases, the DOE decision-maker needs a more specific answer as expressed, both in the Findings and Recommendations of the Review Panel. In

effect, the decision-maker is asking for assistance to make a decision. The appropriate criteria are as follows:

- Based on the technical merit of the project, is the likelihood of its broad deployment reasonably high?
- Based on the DOE-identified needs, is the likelihood of the deployment of the project reasonably high?
- Based on the overall assessment of the project, should it be continued?

4. Economics

Many projects may be technically sound and applicable to DOE needs and yet may be economically unacceptable. Ideally, life cycle costs should be the guiding data and thus the appropriate criterion would be as follows:

- Is the project cost effective as demonstrated by life cycle assessment or other appropriate quantitative methods?

5. Ecological and Stakeholder Issues

Ecological risk and stakeholder participation often drives the applicability of a technology. Thus, the relevant criteria are as follows:

- Have ecological risks been adequately addressed?
- Has the Project Team collected sufficient data to respond to stakeholder concerns?

6. Personnel and Facilities

The qualifications of the PIs and the availability of the necessary facilities are normal review criteria for grants awarded by many federal agencies. However, projects that have already been funded and are in progress are based on an inherent assumption that these requirements were considered during the initial funding. Therefore, the criteria related to personnel qualifications and facilities apply only to new starts as follows:

- Is the Project Team qualified to initiate and conduct the proposed project?
- Does the Project Team have access to facilities that are appropriate to initiate and conduct the project?

7. Safety and Health (S&H)

As stated in the DOE EM's S&H Policy and Action Plan, the DOE EM is committed to maintaining a program that is second to none in dedication and skill with which is promotes occupational safety and health for those developing and using new environmental remediation technologies during all phases of development and deployment.

Review Criteria for Technologies at the Basic Research Stage

Reviewers of proposed research should include the following safety and health criteria in the review process as appropriate:

- Will the operators of the proposed technology be at reduced risk from occupational health and safety hazards as compared to the baseline technology that it will replace?
- Will maintenance workers who service the proposed technology be at reduced risk from occupational health and safety hazards as compared to the baseline technology that it will replace?
- Have historical data been considered on worker injuries associated with technologies similar to the one being proposed?
- If one or more chemicals will be used in the process, is there a written demonstration that health and safety risks have been fully explored? In particular, are Material Safety Data Sheets available for the chemicals?
- Is there sufficient evidence that the principles of "inherently safer" design have been considered in the design of the proposed technology?
- Is there any evidence that safety and health professionals were consulted during the initial research and proposal generation?
- Has the project team collected sufficient data to respond to regulatory concerns?
- Is it clear that the project team will have access to sufficient safety and health expertise as the technology is developed and demonstrated?

- Considering criteria 1-8, have occupational health and safety issues been adequately addressed?

Review Criteria for Technologies at the Development Stage

Reviewers of technologies to be developed based on successful research should use the following criteria:

- Has a safety analysis of the technology been performed?
- Was the safety analysis appropriate to the complexity of the technology?
- Were the analyses conducted by teams with the necessary expertise?
- Were any of the analyses conducted or reviewed by an independent organization?
- Did the analyses reveal any potentially serious hazards that could not be corrected through engineering changes?
- Does the technology rely heavily on work practices and personal protective equipment to protect the operator and maintenance personnel?
- Were measurements or estimates made for exposures to noise, airborne chemical agents, dusts, or radiation? In particular, did they indicate acceptable levels?
- Do the cleanup capabilities of the technology appear sufficiently important in comparison to the residual risks remaining for workers to warrant going forward with a demonstration of the technology?
- Has the project team collected sufficient data to respond to regulatory concerns?

Review Criteria for Technologies at the Demonstration Stage

Reviewers of technologies to be demonstrated based on successful research and development should use the following additional criteria:

- Has the project team developed an acceptable written health and safety plan for the demonstration of the technology?

- Is the implementation of the health and safety plan adequately addressed?
In particular, are the roles and responsibilities of health and safety professionals clearly and adequately identified?

3.5 Technology-Specific Peer Review Criteria

The core technical peer review criteria are used to develop technology-specific criteria. This responsibility lies with the FA/CC Program Managers requesting the review. Clearly, not all review criteria apply to all projects. Furthermore, experience shows that any one of the above criteria may result in many project-specific criteria. In particular, the technical validity of a project may result in a rather large number of project-specific criteria.

The process for preparation of technology-specific review criteria is as follows:

- Among the technical core criteria, those dealing with relevancy and technical validity require identification of technology-specific criteria. Therefore, the primary focus of development of technology-specific criteria must be devoted to relevancy and technical validity.
- Criteria on economics, risk, and S&H apply to most technologies. Accordingly, unless there is a compelling reason, technology-specific criteria must be provided for these criteria
- Criteria on Personnel and Facilities apply only to new starts particularly those covered in Type IV reviews.

Once technology-specific criteria have been identified, they are provided to the TS who ensures their consistency with the core technical peer review criteria as well as the requirements on style and format. Subsequently, they are submitted to the ASME/PRC in conjunction with approval of the RP members.

3.6 Preparation for Peer Review

For Types I, II, III, and IV reviews, at least 45 days prior to the date of the review, the AMPRP and CPR must receive the following information:

- A list of technology specific criteria from the FA/CC POC
- A project summary from the PI

For review Types I, II, III, and IV reviews, at least 30 days prior to the date of the review, the PI must submit the required technical documentation as detailed in Section 3.7 below.

For review Types I and II, the presenter of the project prepares for the material

based on the technology-specific criteria. Type III and IV reviews do not require presentations to the RP. However, a telephone conference call may be arranged to answer any questions regarding the technology being peer reviewed.

3.7 Document Preparation

There are two distinct documentation requirements for Type I, II and III peer reviews. The first type of documentation relates to the gate status of a technology. Figure 4 contains the required documentation for the corresponding maturation level of the technology. The other type of documentation deals with specific information that the RP must also be provided with:

- A documented description of the DOE need that is being addressed
- A description of the current relevant knowledge consisting of published technical information and industrial practices including information on competing technologies
- A detailed description of the study including the experiments and their results. Note that this section constitutes the bulk of the document.
- A list of publications in peer-reviewed technical journals.

The internal reports, presentations at scientific meetings, and publication in proceedings of symposia do not qualify as publication in peer-reviewed journals.

3.8 Response to the RP Recommendations

OST policy requires that responses to the recommendations of the RP be submitted and received by the AMPRP through the CPR, within 60 calendar days of the FA/CC Program Manager's receipt of the *Report of the Review Panel*. Generally, the PI prepares the response to the recommendations of the RP. The DOE response should be reviewed by the Field Lead Program Manager and the Headquarters Program Manager. The CPR ensures that the response is in the proper format and complete. The DOE Response Report must be approved by the HQ FA/CC Program Manager for it to be considered an official response. An example of an appropriate response follows:

EXAMPLE:

Technology Title: As presented in TMS

Recommendation: The development and application of this technology should be continued.

DOE Response: The Focus Area concurs with this recommendation. This

technology continues to show promise in several waste treatment and industrial separation applications. Due to several factors, the cooperative agreement with the vendor will expire without reaching its ultimate goal of building a large scale production facility. We have been successful in helping the vendor establish intermediate-scale production capability, and in completing Research and Development activities so that it can pursue a full-scale production facility on its own.

The findings of the RP respond to the review criteria and contain the rationale for recommendations of the RP. If the responder for FA/CC agrees with the RP's recommendation, a narrative response and a plan of action is necessary. In case of disagreement the responder must provide a technical justification for disagreement. The response would benefit from the inclusion of references to scientific literature.

Figure 4. Documentation Required For Peer Review by Gate Location

DOCUMENTS	GATES					
	1	2	3	4	5	6
Proof of Principle	√	√	√	√	√	√
Literature Review	√	√	√	√	√	√
Publications in Peer Reviewed Journals	√	√	√	√	√	√
Needs Document		√	√	√	√	√
Test Plan at the appropriate scale		√	√	√	√	√
Data Quality Assurance Plan			√	√	√	√
Proof of Design				√	√	√
Technology Safety Data Sheets				√	√	√
Construction Plan					√	√
Implementation Plan						√

* Review of existing relevant information derived from technical literature. Refer to Procedure 11 of “Procedures for ASME/OST PR” (Item 2: Technical Status)

4.0 Roles and Responsibilities

4.1 OST Office Directors and HQ Program Managers

The OST Office Directors and the HQ FA/CC Program Managers are responsible for the overall program management for activities under their purview. Included in this will be the review and approval of peer review of technologies from identification to the response phases of reviews. It is the HQ Program Managers' responsibility to transmit the official DOE response to the RP's recommendations to the CPR within the allotted time of 60 days after receipt of the *Report of the Review Panel*. Should additional time be needed in preparing the response, the CPR should be notified immediately.

4.2 FA/CC Field Lead Program Managers

The FA/CC Field Lead Program Managers initiate the review process by making requests for technical peer reviews to the CPR in collaboration with their HQ counterparts. Other responsibilities include developing a prioritized list of technologies to be reviewed, coordinating responses to the recommendations of the RP, and covering the cost of FA/CC program personnel and material needed to prepare for the requested peer reviews. In addition, it is the responsibility of the Field Lead Manager to make sure that the DOE response and the action plan is in the correct format and addresses all the RP's recommendations. He/she is the federal representative that ensures the action plan is carried out at the Field.

4.3 FA/CC Points of Contact for Peer Review

Usually, the CPR interacts with a POC, generally a federal employee, who is specifically designated by the Field Lead Program Managers for each of the FA/CC program. This person arranges for the PI to provide relevant technical documentation early, at least 30 days prior to the scheduled review date. In addition, this person is responsible for preparing the technology specific criteria in coordination with the HQ program manager and the FA/CC field lead program manager. They must also respond to requests for supplemental materials to expedite the review. In the event that sufficient technical documentation cannot be provided by the Project Team, the CPR will deem it necessary for the review to be cancelled.

During the actual review, this POC or a federal representative from the appropriate FA/CC program is required to be present in order to ensure that the PI understands the importance of the peer review.

Once the *Report of the Review Panel* is received by the FA/CC Project Team, the POC must ensure that any potential misunderstanding, obvious errors and similar issues are identified and provided to the AMPRP within 5 working days of its receipt.

4.4 Principal Investigators

The PI provides technical documentation to the AMPRP, through the CPR, which should conform to the requirements in section 3.7 of this guidance document. This documentation must reach the Office of the AMPRP at least 30 days prior to the review date. The PI is also responsible for preparing the project summary for the technology being reviewed.

4.5 Peer Review Coordinator

The CPR represents the DAS and is the principal federal official responsible for the formulation of the *Implementation Guidance* that describes the mechanics of the OST Peer Review Program. The CPR is the key official for initiating the preparation of candidate technologies to be reviewed , and is the link between the OST staff and the ASME/RSI staff. The activities of the CPR include:

- Overseeing the grant with the ASME/RSI
- Overseeing the budget to support the program and associated OST activity metrics
- Maintaining the peer review records for OST including the TMS Peer Review Module and monthly status reports
- Updating Peer Review Guidance Documents
- Implementing the Recommendations of the ASME PRC
- Participating in the preparation and execution of Peer Review Training for OST

4.6 Headquarters Peer Review Program Manager

The HQ Peer Review Program Manager within the OST is responsible for monitoring overall peer review activities and providing policy, program planning, and budget direction for OST peer review activities, in close collaboration with the CPR at the Chicago Operations Office.

4.7 Administrative Manager of the Peer Review Program

The AMPRP is the principal link between the peer review operation at ASME/RSI on one side and the CPR, other OST officials and OST contractors on the other side. The activities of the AMPRP include the following:

- Interacting with the CPR to resolve issues of concern;
- Providing the project team with appropriate information for preparation for peer review of their project;
- Management of RP meetings;
- Copy editing and distributing the *Report of the Review Panel* to CPR, FA/CC Program Managers, PIs and others who request them; and
- All other administrative activities related to the operation of the peer review program.

4.8 Technical Secretary of the Review Panels

The TS is responsible for the technical aspects of the review program. The responsibilities of the TS include the following:

- Assisting the RPs in preparing the *Report of the Review Panel*;
- Evaluating the technical information provided by the project team in terms of their suitability for distribution to the RP;
- Preparing or assisting in the preparation of the summary of technologies to be reviewed;
- Assisting in the preparation of technology-specific review criteria;
- Resolving problems identified by the project team within five days after the issuance of the *Report of the Review Panel*;
- Responding to technical issues from members of the RPs, and the Project Team;
- Preparing the *Interim Report* which entails combining the *Report of the Review Panel* and the DOE response.

REFERENCES

1. American Society of Mechanical Engineers, Center for Research and Technology Development, August, 1998. "Manual for Peer Review"
2. Moore, J.O., April 25, 1997 "Technology Decision Process Procedure" - Version 7, U.S. Department of Energy Oak Ridge Operations Office
3. U.S. Department of Energy, Office of Technology Development (EM-54), August 27, 1993. "Planning and Conducting Technical Peer Reviews" (Standard Operating Procedures - Procedure No. EM-50-3.2.2)
4. Committee on the Department of Energy - Office of Science and Technology's Peer Review Program, Board on Radioactive Waste management, Commission on Geosciences, Environment, and Resources, National Research Council, 1997, "Peer Review in the Department of Energy - Office of Science and Technology: *Interim Report*"
5. Attachment from DOE Memorandum, G. Boyd to A. Taboas, October 29, 1997, "Program Directions for the Office of Science and Technology (OST) Peer Review Process"
6. Committee on the Department of Energy - Office of Science and Technology's Peer Review Program, Board on Radioactive Waste Management, Commission on Geosciences, Environment, and Resources, National Research Council, 1998, "Peer Review in Environmental Technology Development Programs – The Department of Energy's Office of Science and Technology"
7. Attachment from DOE Memorandum, T. Fryberger to Distribution, January 31, 2001, "Tracking Maturity in DOE's Environmental Management Science and Technology Program, Revision 1"